

Notice of Allowability

Application No.

10/065,641

Applicant(s)

RENOU ET AL.

Examiner

Fred Ferris

Art Unit

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 20 November 2006.
2. ☒ The allowed claim(s) is/are 1-36.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material

5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


FRED FERRIS
PRIMARY EXAMINER
TECHNOLOGY CENTER 2100

DETAILED ACTION

1. *Claims 1-36 have been presented for reconsideration based on applicant's arguments filed on 20 November 2006. Responsive to applicants defining arguments, claims 1-36 are now allowed over the prior art of record.*

Response to Arguments

2. *Applicant's arguments filed 20 November 2006 have been fully considered and found to be persuasive.*

Regarding applicants response to 103(a) rejection: *In response to the examiners request for clarification of the term "targets" as it applies to parameters for integrating the design of operation and control of the claimed dynamic optimizer/controller, applicants have now argued that the term is defined as disclosed in paragraphs beginning on page 7 of the specification. As such, the examiner now interprets the process of how the optimizer "targets" the parameters in design optimization as disclosed therein. (i.e. limits on imposed by control constraints, parameters limited in bounds as by the operation model (feed forward of parameters), and "integrating the design of the operations and the controls for a gas turbine" to include parameters relating to defined objective functions, relevant operations, and control constraints or partially derived based on rules.) In clarifying the claimed subject matter over the prior art, applicants have further referenced previous arguments relating to the paragraphs beginning on page 8 of the specification as a distinguishing definition of the claimed "online dynamic optimizer/controller". (e.g., para:0038-0042, Fig. 3) Accordingly, the examiner withdraws the 103(a) rejection in view these defining arguments.*

Allowable Subject Matter

3. *Claims 1-36 are allowed over the prior art of record.*

The following is an examiner's statement of reasons for allowance:

Applicants are disclosing a computerized method and apparatus for gas turbine operation and control optimization using model based control (i.e. "model predictive control") inclusive of generating a gas turbine model with objective functions and defining operations and control constraints by dynamically optimizing the gas turbine model online (i.e. over the Internet). This has been disclosed in the prior art of record. As such, applicants have not invented "model based control", i.e. using "model predictive control" (specification paragraph [0043], See: Perry's Chemical Engineers' Handbook, 7th Edition, page 8-25) or, optimization over the internet. (See: Chan: para:0030, Fig. 5, Reed: Section 3, Figs. 3, 4) The prior art also teaches "models" inclusive of "objective functions". (See: Bankert, CL4-L14-16, or Hacker, Abstract, Section 3, Fig. 4, for example)

While these elements are individually disclosed in the prior art, the prior art of record does not meet the conditions as suggested in MPEP section 2132, namely:

*"The identical invention must be shown in as complete detail as is contained in the ... claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an **ipsissimis verbis** test, i.e., identity of terminology is not required. **In re Bond**, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990)."*

In particular, the prior art of record does not disclose the specific sequence of method steps or arrangement of apparatus elements relating to generating/computing an operations model, defining operations and controls constraints for the operations model, in combination with providing as online dynamic optimizer/controller dynamically optimizing gas turbine control operation using model based control on the operations model and the operations and control constraints as required by independent claims 1 and 22. Here the examiner has interpreted the claimed “dynamic optimized/controller” as defined by applicant’s specification, on page 8, paragraphs [0007], [0038]-[0042], Fig. 3.

The closest prior art uncovered during examination teaches certain limitations of the claimed invention as follows:

- US Patent 5,633,800 issued to Bankert et al: teaches gas turbine operation and control optimization inclusive of generating a gas turbine model with objective functions, but does not explicitly disclose generating/computing an operations model, defining operations and controls constraints for the operations model, in combination with providing as online dynamic optimizer/controller dynamically optimizing gas turbine control operation using model based control on the operations model and the operations and control constraints as required by independent claims 1 and 22.*
- US Patent Application Publication 2002/0123870 issued to Chan et al: teaches dynamic optimization of turbine design in an online environment, but again, does not explicitly disclose generating/computing an operations model, defining*

operations and controls constraints for the operations model, in combination with providing as online dynamic optimizer/controller dynamically optimizing gas turbine control operation using model based control on the operations model and the operations and control constraints as required by independent claims 1 and 22.

US Patent 6,823,253 issued to Brunell: [Same assignee] teaches the elements of the present invention as claimed with the exception that the recited dynamic optimizer/controller carries out the operations model and the operations and control constraints using an Extended Kalman Filter for estimation. Here the examiner has interpreted the instant application to be patentably distinct over U.S. 6,823,253 by virtue of the operation of the optimizer/controller as described in paragraph [0007] of the instant specification where for a given control/simulation time period, the control action optimizes an objective function based on the operation model while respecting the applicable constraints (i.e. no requirement for Extended Kalman Filter estimation, see U.S. 6,823,253 CL1-L60-CL2-L5, where a corrective action is applied to the current state, for example).

The features noted above render the claimed invention non-obvious over the prior art of record. Dependent claims 2-21 and 23-36 are deemed allowable as depending directly or indirectly from independent claims 1 and 22 respectively.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

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accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

4. *Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred Ferris whose telephone number is 571-272-3778 and whose normal working hours are 8:30am to 5:00pm Monday to Friday. Any inquiry of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is 571-272-3700. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached at 571-272-2279. The Official Fax Number is: (571) 272 8300*

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